

ABSTRACT

A diamond ultraviolet luminescent element (10) having a current-injection light-emitting diode structure includes a high-quality boron-doped p-type diamond crystal (semiconductor layer) (1) synthesized by the high pressure and high temperature method; a phosphorous-doped n-type diamond crystal (n-type semiconductor layer) (3) formed on the first diamond surface by the chemical vapor deposition; an electrode (5) formed on the surface of the n-type semiconductor layer (3); and an electrode (7) formed on the surface of the p-type semiconductor layer (1). The luminescence (235nm) attributed to the recombination of free excitons resulting from current injection dominates in ultraviolet wavelength region (10).